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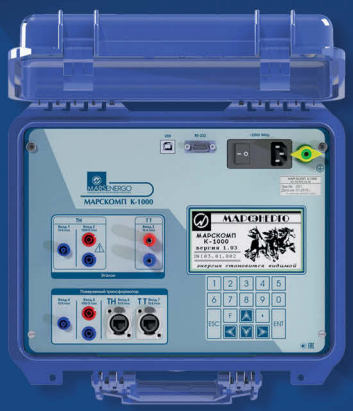
CATALOG 2026

Instruments for Power Industry



Reference instruments and test systems for

- Energy meters
- Instrument transformers
- EV charging stations

Instruments for Power Industry

MARSENERGO

THREE-PHASE SECONDARY STANDARD OF ELECTRICAL POWER AND POWER QUALITY

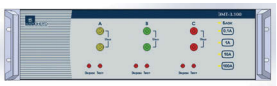
PCS-ME 3.0

Accuracy class 0.004

Purpose

The system is a secondary standard of AC power applied for accuracy testing (calibration) of:

- Single- and three-phase active and reactive energy meters (up to 120 A, 100...400 V, accuracy class 0.02, or less accurate)
- Single- and three-phase meters of accuracy class 0.02 used to measure active, reactive, and apparent power/energy
- Voltmeters (up to 500 V), ammeters (up to 120 A) operating in the frequency range of up to 450 Hz
- Instruments measuring power quality as applied to Russian Standard GOST R 8.655–2009.

No	Product name	Description, specifications
1.	Reference multimeter 3458A (3 pcs)	Analog-to-digital voltage converters U_{nom} = 0.1, 1.0, 10 V Range: from 0.001 to 10.0 V ±0.0015 %
2	Single-phase inductive voltage dividers DNI-500 (3 pcs)	Primary converters of AC voltage Range: 5 to 500 V 100:1, 10:1 ±0.002 % ±0.05 min
3	Three-phase instrument electronic current transformer EMT-3.100 (1 pc) 	Primary AC current-to-voltage converters I_{nom} = 0.1, 1.0, 10, 100 A Range: from $0.1 \cdot I_{nom}$ to $1.2 \cdot I_{nom}$ Secondary voltage U_2 from 0.01 to 1.0 V Current sensor ratio (A/V): I_{nom}/U_2 ±0001% ±0.05 min
4	Waveform generator 33522V	• Precision source of reference frequency 1 Hz and 10/20 MHz ±1.0·10-6 (ADC synchronization) • Reference frequency output for error calculation
5.	Phantom power source:	
5.1	6-channel waveform generator Energoforma 3.1E	AC voltage: 3 × 0.01 to 576 V / 50 VA AC current: 3 × 5 mA to 120 A / 120 VA Phase angles: 3 × –180 ° to +180 ° Fundamental frequency: 16 to 450 Hz Harmonic (interharmonic) order: 2 to 50 (50.5) Dips, swells, flicker, unbalance: IEC61000-4-30
5.2	Single-phase current amplifier CA-3.1 (3 pcs)	
5.3	Three-phase voltage amplifier VA-3.1	

REFERENCE-CLASS REACTANCE-FREE CURRENT SHUNTS

AC Current Shunts

Rated current: 1 mA to 100 A

History

The first prototype was manufactured at the D.I. Mendeleev All-Russian Institute for Metrology (VNIIM) in the late 1970s. Nowadays similar shunts are serially produced by Fluke Corporation (USA) under the brand «A40B Current Shunts» (No. 51518-12).

Mars-Energo manufactures sets of reference-class reactance-free AC Current Shunts in various configurations depending on the rated current and resistance.

General specifications

Parameter	Value
Rated current (I_{nom}), A	0.001, 0.02, 0.1, 0.5, 1, 2.5, 5, 10, 50, 100
Limits of permissible error in measuring the difference between the values of AC and DC current within the operating frequency range, %	±0.005...0.015
Operating AC frequency range, kHZ	from 0.02 to 100
Relative change in resistance due to self-heating, %	±0.003 or less
Temperature Coefficient of Resistance (TCR), K^{-1}	$1.0 \cdot 10^{-6}$ or less
Rated voltage, V	0.8 or 1

0.1 A 10 A 100 A

STATIONARY TEST SYSTEM

MTS-ME 3.1KM-S

Application

Semi-automatic test system for accuracy testing/calibration/verification of energy meters and instruments for electrical measurements

The system is applied as a **working standard of AC power of the first grade (class 0.02) and second grade (class 0.05)**

National Registry Number 57346-14

Tested devices

1 Single- and three-phase active and reactive energy meters (accuracy class 0.05 or less accurate) including smart meters with integrated power quality measurement function (class S)

Energy meter

2 Single- and three-phase devices measuring active power, reactive power, phase angles, frequency, voltage, and current (accuracy class 0.05 or less accurate) up to 120 A, 997 V

Energomonitor3.3T1

3 Measuring converters of voltage, current, active power, and reactive power (accuracy class 0.2) with unified low-voltage output (within industrial frequency range)

Measuring converter

4 Power quality analysers (compliant with Russian state standard GOST 32144) equipped with AC current probes up to 3000 A

PQP-A Energotester

Delivery set

DC Current Source (optional)

*Voltage Divider **DNI-3.1** (optional)*

*Three-phase voltage amplifier **VA-3.1***

*Reference standard **Energomonitor 3.1KM-S** Accuracy classes 0.02; 0.05*

*Three-phase waveform generator **Energoforma 3.1***

*Switchgear unit **CS-3.1***

*Current amplifiers **CA-3.1** (3 pcs)*

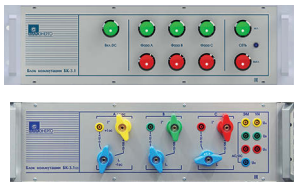
Instrument rack and cables

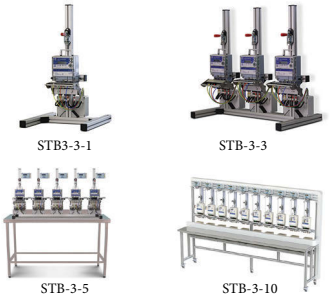
5-position rack

10-position rack

Multi-position meter suspension rack

Basic scope of supply

No	Product name	Description, specifications
1.	Reference standard Energomonitor - 3.1KM-S	0.02 / 0.05 Voltage: 0.1÷960 V; ±0.01 %; ±0.02 % Current (AC/DC): 1 mA÷120 A; ±0.01 %; ±0.02 % Angles U-I, U-U: –180°...+180°; ±0.01°; ±0.01° Active power: ±0.015%; ±0.05 % Reactive power: ±0.03 %; ±0.1 % Frequency: 42÷70 Hz; ±0.001 Hz; ±0.003 Hz Harmonics (interharmonics): 2÷50 (50.5); IEC 61000-4-7 Flicker: IEC 61000-4-15 Power quality: IEC 61000-4-30
2.	Phantom power source	
2.1.	Three-phase waveform generator Energoforma-3.1	AC voltage: 3 × 0.1 to 576 V / 200...400 VA AC current: 3 × 1 mA to 120 A / 150...1200 VA Angles: 3 × 0° to 360° Fundamental frequency: 16 tto 450 Hz Harmonic (interharmonic) order: 2 to 50 (50.5) Dips, swells, flicker: IEC61000-4-30 DC voltage*: 0 to 600 V / 600 W DC current*: 0 to 100 A / 600 W *with DC Current Source
2.2.	Current amplifiers CA-3.1 (3 pcs)	
2.3.	Voltage amplifier VA-3.1	
3.	Switchgear unit CS-3.1 (comes in two modules in AC/DC modification) 	Incorporates commutation circuits and circuit breakers, applies current and voltage signals from the phantom power source to the reference and tested devices (in either AC or DC test modes)
4.	Software	▪ Reads test resullts and stores them on a PC ▪ Sets up test signals in the generator ▪ Provides for testing instruments in both manual and automatic modes ▪ Creates test reports
5.	Instrument rack Set of cables	The instrument rack includes: ▪ Power socket block ▪ Cable storage box

No	Product name	Description, specifications
1.	STB  STB3-3-1 STB-3-3 STB-3-5 STB-3-10	STB is a meter suspension rack designed to position 1, 3, 5, or 10 three-phase meters, or up to 30 single-phase meters. The rack provides quick connection of tested meters to a meter test system.
2.	SMCD-3 SMCD-5 SMCD-10	Isolating voltage transformer for testing single-phase energy meters with closed U-I links. The transformer provides galvanic isolation between the current and voltage circuits of single-phase energy meters.
3.	TTR-3.100	Isolating current transformer for testing three-phase energy meters with closed links between current and voltage circuits in 3, 5, or 10-position test bench (National registry No. 85612-22)
4.	DNI-3.1 (1:10, 1:100)	Three-phase inductive voltage divider used to reduce the voltage produced by a voltage amplifier making it possible to extend the lower range of the source to 0.1 V (supplied with MTS-ME 3.1KM-S-XXX-110-25/50-0.1/528 model)
5.	Calmar - S Error calculator	Calmar-S is a volt/mA Calibrator (National Registry No. 69182-2017) that makes it possible to perform: - Automatic calibration (operating as an error calculator) - Calibration of measuring transducers with standard DC current or voltage outputs
6.	SH-I, SH-E, PF PF SH-I(E)	SH-E is a scanning head for reading LED pulses, SH-I detects disc marks of induction meters, PF (Pulse Former) is used to adjust pulses from tested meters to the input of the reference meter or to generate pulses manually by pressing the button (e.g., when disc marks are unreadable).
7.	KT (10; 20; 100; 300-turn coils) KT-3-10 (20) Current output 100 (200) A KT-3-100 Current output 1000 A KT-1-300 Current output 3000 A	The calibrated coils of KT series are used to multiply test current when testing AC current probes (rated at 100 A, 1000 A, or 3000 A), or when testing the devices equipped with such current probes.
8.	DC Current Source	Produces DC voltage and current test signals (supplied with MTS-ME 3.1KM-S-XXD-110 model).
10.	Time Correction Module TCM-02C	Produces UTC correction signals that may be used to align the clocks of computers and meters to Coordinated Universal Time (National Registry of Measuring Instruments No 44097-10).
11.	Laptop and printer	Accessories for automatic testing and printing calibration reports
12.	Work table, rolling table and operator chair	Furniture for convenient operation

METER TEST SYSTEM

MTS-ME21

Accuracy class: 0.02, 0.05

New capabilities

MTS-ME21 is specially designed for testing / calibration of LPIT-compatible electronic energy meters with analogue inputs (accuracy class 0.5S or less accurate).

Highlights

- ✓ Expanded measurement ranges: 1 mV ... 960 V (1000 V DC); 1 mA ... 120 (3000) A
- ✓ Fundamental frequency 40 to 400 Hz
- ✓ Reference Standard of the 1st (2nd) grade as stated by Rosstandart, Order No 1436 (A-E)
- ✓ Multi-position rack equipped with error calculators and isolating transformers for testing of meters with closed I-U links

Scope of supply

No	Product name	Description, specifications
1.	Reference standard **Energomonitor - 3.1KM-E** Voltage Amplifier **VA-6.1**	▪ 6 V to 960 V / 1 mV ... 960 V ▪ 1 mA to 120 A ▪ Accuracy class 0.02 or 0,.5 ▪ Fundamental frequency 40 ... 400 Hz
2.	Test Signal Source: - Generator **Energoforma-3.1E** - Amplifiers **VA-3.1** and **CA-3.1**	▪ 1 mV to 10 V (up to 998 V with VA-3.1) ▪ Voltage setting in increments of 0.0001 V ▪ 3 phases Uu, 3 phases Ui ▪ 50 harmonics ▪ 0.05 VA (without amplifiers VA and CA)
3.	Error Calculator **EC-3.1**	Provides for automatic testing/calibration
4.	**Software Energoforma MTS-E**	▪ Reads test results and stores them on a PC ▪ Sets up test signals in the generator ▪ Provides for testing instruments in both manual and automatic modes ▪ Creates test reports
5.	**Optional accessories - see p. 4**	

Tested devices:

- Conventional energy meters of accuracy classes 0.05 and 0.2
- Power quality meters (class A)
- LPIT-compatible electronic meters

LPIT-compatible meters

PORTABLE TEST SYSTEM

MTS-ME 3.3T1-P (3.1KM-P)

Accuracy class 0,1 (0,02; 0,05)

Application

Designed for on-site or in-lab automatic testing/calibration of:

- Single/three-phase energy meters
- Watt meters, varmeters, phase-angle and frequency meters, voltmeters, ammeters
- Power quality meters (IEC61000-4-30)

MTS-ME 3.3T1-P-10	MTS-ME 3.1KM-P-05	MTS-ME 3.1KM-P-02
accuracy class 0.1	**accuracy class 0.05**	**accuracy class 0.02**
*Testing of instruments of **0.5S accuracy** class or less accurate* (excluding power quality meters)	*Testing of instruments of **0.2S accuracy class** or less accurate*	*Testing of instruments of **0.05 accuracy class** or less accurate*

Reference meter

Energomonitor 3.3T1
accuracy class 0.1

Energomonitor 3.1KM-P-05
accuracy class 0.05

Energomonitor 3.1KM-P-02
accuracy class 0.02

Three-phase phantom power source

Energoforma 3.3-12M
12 A, 300 V

or

Energoforma 3.3-120M
120 A, 480 V

Software «EnForm»

Components of hardware and software system ME Service-P

Calmar-S

TCM-02C

USB-4RS232

Software EnForm-sMTS

Environment monitor

PORTABLE TEST SYSTEM

MTS-MONO-ME

Accuracy class 0.05

National Registry Number 89778-23, calibration interval 2 years

Specifications for generator and reference meter

Parameter (generation and measurement)	Modification		
	3.120	1.120	3.12
AC current	3 x 5 mA ÷ 120 A	1 x 10 mA ÷ 120 A	3 x 10 mA ÷ 12 A
Voltage	3 x 6 ÷ 576 V	1 x 6 V ÷ 300 V	3 x 6 V ÷ 300 V
Harmonics	up to 50		
Interharmonics	up to 50.5		
DC current and voltage	±30 mA; ±15 V (for «-K» model)		

1. MTS-MONO-ME 3.120

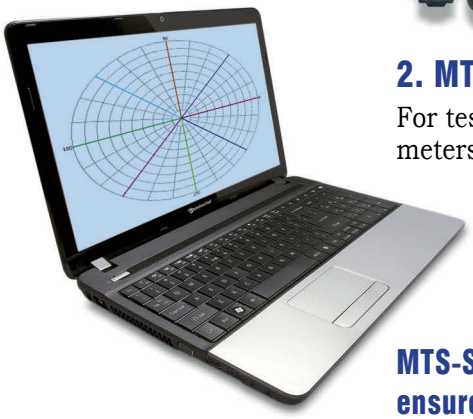
For testing of single- and 3-phase meters connected directly or via transformers

2. MTS-MONO-ME 1.120

For testing of single-phase meters connected directly

3. MTS-MONO-ME 3.12

For testing of single- and 3-phase meters connected via transformers



MTS-Service software ensures automatic control of test procedures

High-voltage metrological mobile lab for testing of instrument transformers

High-Voltage Mobile Test Lab
(6 to 330 kV, 500kV, 5 kA, 30 kA)

MarsLab-CT/VT

Accuracy class 0.05, 0.1

Application

Intended for accuracy testing and verification of instrument voltage transformers ranging from 6 to 330 kV, or to 500 kV and current transformers rated up to 5 kA (or up to 30 kA) in either laboratory or field conditions.

Scope of supply

No	Product name	Description, technical specifications
1.	Vehicle	Van-mounted mobile lab equipped with: - Shelves and cupboards for laboratory equipment - Diesel generator - Lighting and extra power points - Workplace for the operator
2.	CT Test Set for testing current transformers of accuracy classes up to 0.2S rated from 5 to 5000 A	Testing and verification of CTs in accordance with certified test procedures.
2.1.	Portable current transformers of reference class TTIP	- TTIP 100/5 or TTIP 100/5(1), 5–100 A - TTIP 5000/5 or TTIP 5000/5(1), 100–5000 A Accuracy class 0.05 Rated currents: TTIP 100/5(1): 5, 10, 15, 20, 25, 30, 40, 50, 60, 75, 80, 100 A TTIP 5000/5(1): 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1500, 2000, 3000, 4000, 5000 A
2.2.	Adjustable current source IT 3000 IT 5000	- IT 3000 (current rating 3000 A) - IT 5000 (current rating 5000 A)
2.3.	Automated source of test current MARS-AIT	Output current range: 0.5-3800 A (0.5-6000 A upon request)
2.4.	Software EmCalibrTrans	Data management and creation of test reports

No	Product name	Description, specifications
3	VT Test Set for testing voltage transformers of accuracy class 0.2S (or less accurate) rated from 0.4 to 500 kV Accuracy class of the reference transformer: 0.05 or 0.1	*Rated primary voltages*: $6/\sqrt{3}$, 6, $10/\sqrt{3}$, 15, $35/\sqrt{3}$, 35, $110/\sqrt{3}$, $220/\sqrt{3}$, $330/\sqrt{3}$, $500/\sqrt{3}$ kV (other ratings are available upon request)
3.1	Single-phase High-Voltage Test Set MarsTest-VT-1 Patent No 67285	On-site testing of single-phase instrument transformers of accuracy class 0.2 rated at 110, 220, 330 kV **MarsTest-VT-1-110** for testing VTs 110 kV **MarsTest-VT-1-220** for testing VTs 110, 220 kV **MarsTest-VT-1-330** for testing VTs 110, 220, 330 kV
3.1.1	Reference Capacitive High-Voltage Transducer CHVT: CHVT-110, CHVT-220, CHVT-330, CHVT-500	Accuracy classes: 0.1 or 0.05 Weight: 25 kg (CHVT-110), 35 kg (CHVT-220), 45 kg (CHVT-330), 120 kg (CHVT-500)
3.1.2	Single-phase High-Voltage Source	- Single-phase variable-ratio transformer (for 220, 330 kV) - Single-phase console unit (PU-220/330) - Mobile high-voltage source UIV or MIVN.
3.2	Three-phase High-Voltage Test Sets MarsTest-VT-3-10 and MarsTest-VT-3-35 Patent No 67285	On-site testing of three-phase and single-phase instrument transformers of accuracy class 0.2 rated at 6, 10, and 35 kV **MarsTest-VT-3-10** for testing VTs 6, 10 kV **MarsTest-VT-3-35** for testing VTs 15, 35 kV
3.2.1	Reference Capacitive High-Voltage Transducer CHVT: CHVT-10-2 and CHVT-35-2 with UIN-D amplifiers	Accuracy classes 0.1 or 0.05 Weight: 4 kg (CHVT-10), 8 kg (CHVT-35)
3.2.2	Three-phase High-Voltage Source	- Set of dry-type VTs (VT-10 or VT-35) (3 pcs) or Set of IOG-type (SF_6 filled) VTs (3 pcs) - Three-phase variable-ratio transformer - Three-phase console unit (PU-10 or PU-35)
3.3	Manually operated burden boxes	$100/\sqrt{3}$ V, 80 VA; $100/\sqrt{3}$ V, 200 VA $100/\sqrt{3}$ V, 80 VA (200 VA); 100 V, 80 VA (200 VA)
3.3.1	Automated burden boxes	Rated secondary voltages: 100/3, 110/3, 100, $100/\sqrt{3}$, 110, $110/\sqrt{3}$ V cos φ: 0.8 and 1 Total burden power: 101.25 VA and 200 VA
3.4	Comparator	- Energomonitor 3.3T1-S with CT Calibration Switch CTCS 1 A and 5 A - Energomonitor 3.1KM-P with CT Calibration Switch CTCS-3.1 - Energomonitor-61850 - MarsComp-K 1000
3.5	Set of cables	Power, measurement, corona-free cables etc.
3.6	Laptop and printer (EmCalibrTrans software)	Controlling test procedures, printing test reports

Mobile Laboratory for testing electronic low-power current and voltage transformers

HML-LPIT

Purpose

HML-LPIT is a mobile laboratory for automatic or manual testing and calibration of LPITs: low-power current and/or voltage instrument transformers.

Sphere of application

Depending on the customer needs, HML-LPIT may include test sets for automatic (PC-controlled) or manual testing of voltage, current, or combined LPITs.
The lab is suitable for both on-site and laboratory testing.

Basic accuracy specifications

Accuracy class of reference current* or voltage** transformer	Permissible limits of measurement errors		
	Ratio error, %	Phase error, min	Composite error, %
0.05	**0.056**	**3.32**	**0.12**

** Range of current – 50 A to 6 kA.*
*** Range of voltage – 340 V to 35√3, or 110√3 V*

The scope of supply

No	Product name	Description, specifications
1.	Automated source of test current MARS-AIT	Output current range: 0.5A to 3000 (5000) A Rated current: 3 kA or 5 kA
2.	Automated source of test voltage MARS-AIN	Output voltage range: 340 V to 10√3 (35√3, 110√3) kV depending on the modification
3.	Reference device for testing voltage transformers Capacitive Voltage Transducer CHVT	Rated voltage: 6, 10, 35, 110 kV Aaccuracy class: 0.1 or 0.05
4.	Reference Current Transformer TTIP-5000	Rated current: 5 kA Accuracy class: 0.05
5.	Comparator MarsComp K-1000	Accuracy class: 0.02
6.	Software E-TransformerTest	Generation of test reports

Dual-channel comparator of voltage

MarsComp K-1000

Accuracy class 0.02

National Registry Number 87150-22

Highlights

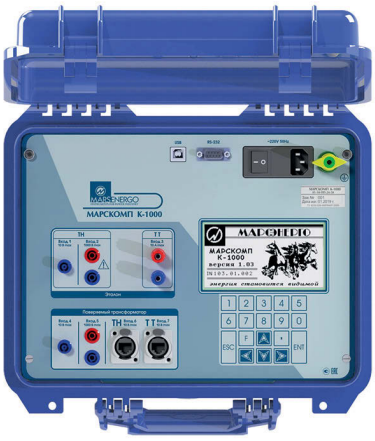
- You can use one comparator for testing LPITs of both types: current and voltage
- You can use conventional current transformers (1A and 5A) and conventional voltage transformers (100 V, 100/√3 V) as reference devices
- Both conventional and electronic voltage transformers can be tested with use of a reference device rated at other secondary voltage, or, in other words, the reference and tested devices may have different scaling factors
- The comparator makes it possible to check the actual value of phase shift declared by the manufacturer
- The comparator can be used for certification of voltage transformers that measure voltage harmonics (the VTs with the frequency response according to IEC 61869-103)
- You can change measurement ranges in the comparator either separately per each channel or altogether
- USB communication between the comparator and PC starts automatically after self-test
- Test reports are created automatically in the E-TransformerTest program

Application

Reference comparator for calibration/verification of voltage and current LPITs (low-power instrument transformers) and conventional instrument voltage transformers

Accuracy characteristics as applied to testing of electronic voltage (current) transformers

Error (absolute)	Limits of permissible error
Voltage (current) ratio error, %	±0.02
Phase error, min	±0.3
Composite error, %	±0,05



MOBILE TEST LAB FOR TESTING DIGITAL TRANSFORMERS

MarsLab-61850

For testing (calibration, verification) of electronic transformers with IEC 61850-9-2 digital outputs:

✓ Current transformers up to 5 kA (IEC 60044-8-2010, MI 3602-2018)

✓ Voltage transformers up to 500/√3 kV (IEC 60044-7-2010, MI 3603-2018).

Basic accuracy specifications

Accuracy class of reference current* or voltage** transformer	Permissible limits of measurement errors		
	Ratio error, %	Phase error,min	Composite error, %
0.05	**0.056**	**3.32**	**0.12**

** Operating current range – 50 A ... 6 kA. ** Operating voltage range – 6/√3 ... 500/√3 kV.*

Scope of supply

No	Product name	Description, specifications
1.	Vehicle	Van-mounted mobile lab equipped with: - Shelves and cupboards for housing laboratory equipment - Diesel generator - Lighting and extra power points - Workplace for the operator
2.	Multifunctional reference setup MarsTest-61850	- Energomonitor-61850, accuracy class 0.02 or 0.005 - MarsGen-61850, accuracy class 0.05 - Voltage and current source Energoforma-61850 or Energoforma-3.3-120M - External time server - Laptop with software installed
3.	Adjustable voltage source	- Single-phase variable-ratio transformer (for 220 or 330 kV) - Single-phase console unit (PU-220/330) - Mobile high-voltage source UIV or MIVN
4.	Adjustable current source	- IT 3000 (current rating 3000 A) - IT 5000 (current rating 5000 A)
5.	Reference device for testing voltage transformers Capacitive Voltage Transducer CHVT	Accuracy class: 0.1 or 0.05 Weight: 25 kg (CHVT-110), 35 kg (CHVT-220), 45 kg (CHVT-330), 120 kg (CHVT-500)
6.	Reference current transformer	- TTIP 100/5 or TTIP 100/5(1), 5...100 A - TTIP 5000/5 or TTIP 5000/5(1), 100...5000 A Accuracy class: 0.05 Rated currents: TTIP 100/5(1): 5, 10, 15, 20, 25, 30, 40, 50, 60, 75, 80, 100 A TTIP 5000/5(1): 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1500, 2000, 3000, 4000, 5000 A

MULTIFUNCTIONAL REFERENCE SETUP

MarsTest-61850-P

Purpose

MarsTest-61850-P is a mobile reference setup consisting of a source of reference signals and a reference standard that measures and analyzers electrical signals from the substation equipment. Unlike traditional reference setups, MarsTest-61850 supports testing (calibration) of both conventional and 61850-9-2LE-compliant equipment.

Sphere of application

MarsTest-61850 is a solution for on-site testing and calibration of measurement channels in either conventional or digital substations.

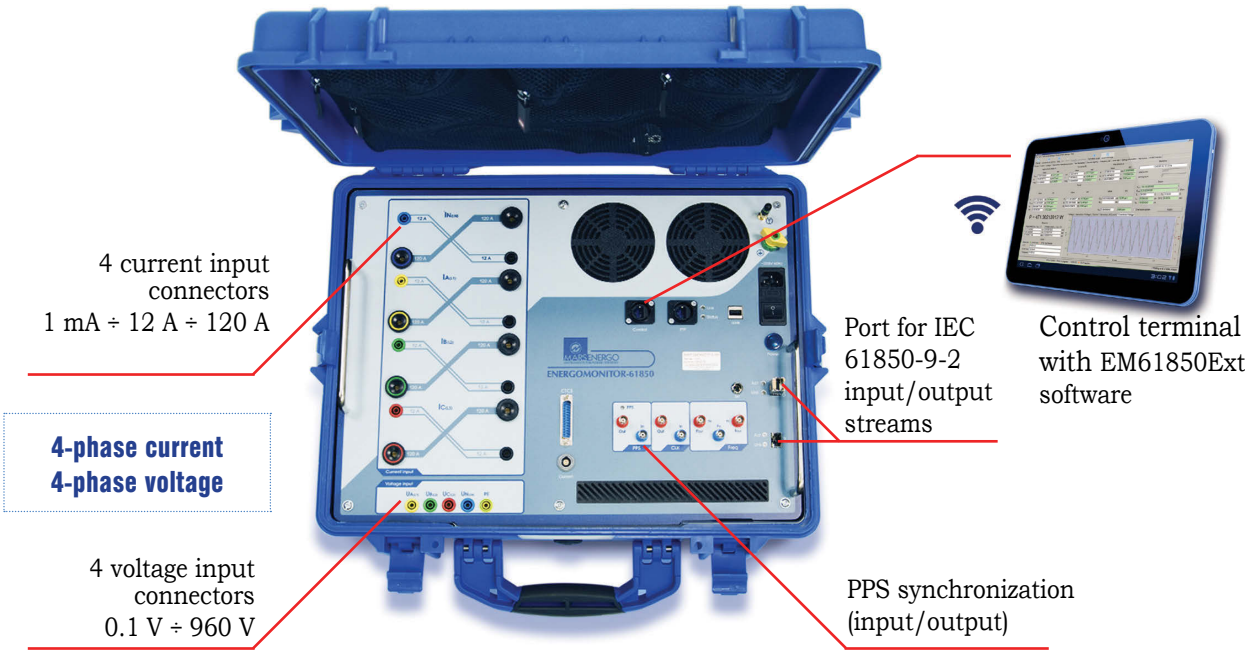
REFERENCE STANDARD FOR
DIGITAL SUBSTATION EQUIPMENT

Energomonitor-61850

National Registry Number: 73445-18 Accuracy class 0.02, 0.05

Purpose

The instrument is designed for accuracy testing of conventional (analogue) energy meters, conventional (analogue) instrument current and voltage transformers, digital current and voltage transformers with IEC 61850-9-2 outputs, and merging units.



Basic accuracy characteristics

Measured parameters	Measurement range	Intrinsic measurement error	
		Accuracy cl. 0.02	Accuracy cl. 0.05
AC voltage	0.1 to 960 V (U_{nom} = 1, 2, 5, 10, 30, 60, 120, 240, 480, 800 V)	±0.01 %	±0.02 %
AC current	1 mA to 120 A (I_{nom} = 0.05, 0.1, 0.25, 0.5, 1, 2.5, 5, 10, 25, 50, 100 A)	±0.01 %	±0.02 %
Phase angle between the 1st harmonics of phase voltages or between the 1st harmonics of voltage and current in the same phase	0° to 360°	Absolute:	
		±0.003°	±0.01°
Reference signal (PPS) frequency	1 Hz	Relative: $\pm 2 \cdot 10^{-6}$	
Active power	$0.1U_{nom}$ to $1.2U_{nom}$ V	Relative:	
	$0.1I_{nom} \le I < 1.2I_{nom}$ A	±0.01 %	±0.05 %
Reactive power	$0.01Q_{nom}$ to $1.44Q_{nom}$ Var	Relative:	
	$0.9 \le \lvert\sin\varphi\rvert \le 1.0$	±0.03 %	±0.1 %
	$0.2 \le \lvert\sin\varphi\rvert \le 0.9$	±0.05 %	
AC frequency	40 to 70 Hz	Absolute:	
		±0.0002 Hz	±0.001 Hz

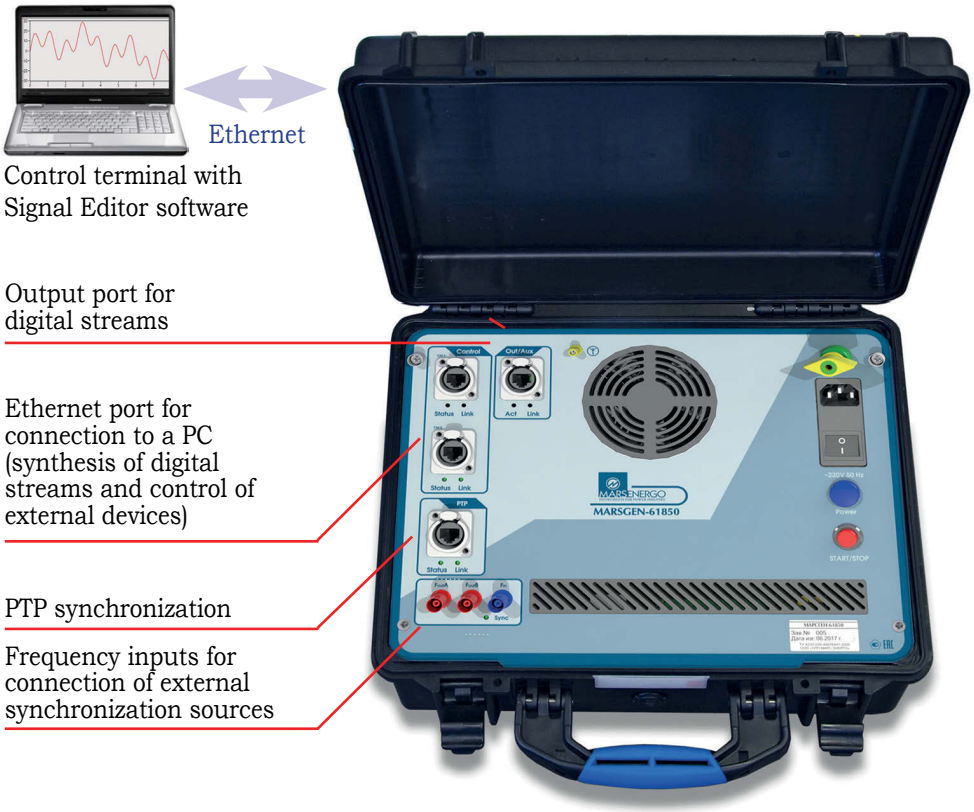
CALIBRATOR OF DIGITAL STREAMS

MarsGen-61850

National Registry Number: 76741-19 Accuracy class 0.05

Purpose

The calibrator MarsGen-61850 synthetizes sampled value (SV) streams according to IEC 61850-9-2. It is intended for testing (calibration) of electrical energy meters, PQ analyzers and phasor measurement units (PMU) with 61850-9-2LE outputs.



Setting accuracy of digital signals

Parameter	Range	Increments	Intrinsic error
Fundamental harmonic			
Fundamental frequency	40 ... 500 Hz	0.00001	±0.0003 %
Voltage	10 mV ... 15 MV	10 µV	±0.03 %
Current	1 mA ... 1.5 MA	1.0 µA	±0.03 %
Phase shift	–180° ... +180°	0.0001	0.03°
Active power	0.01 W ... 15 TW	—	±0.05 %
Power quality parameters			
Harmonic (interharmonic) order	0.1 ... 50	0.1	—
RMS of voltage or current harmonic (% of fundamental)	0 ... 50 %	0.0001	±0.01 %
Flicker	0.2 ... 10	—	±1.5 %
Duration of events	0.02 ... 600 s	—	0.005 s
Frequency of the reference signal (PPS)	1 Hz	—	$\pm 2 \cdot 10^{-6}$ Hz

NEW CAPABILITIES OF APPLICATION:
MULTIFUNCTIONAL REFERENCE STANDARD

Energomonitor-3.1KM-A

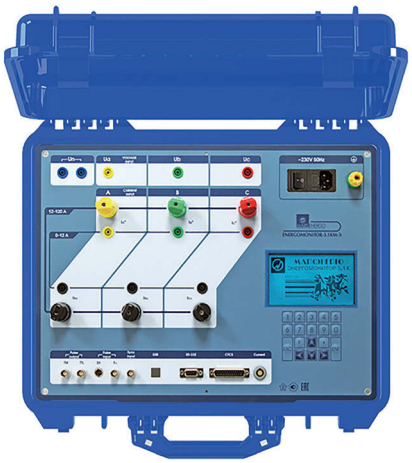
WHEN USED TOGETHER WITH ELECTRONIC CURRENT TRANSFORMER

EMT-200
EMT-500

provides for on-site testing (calibration) of DC EV charging stations in 2 ways: ❶ Testing the station as a whole unit ❷ Testing the components of the station (DC meters) individually

TEST SET

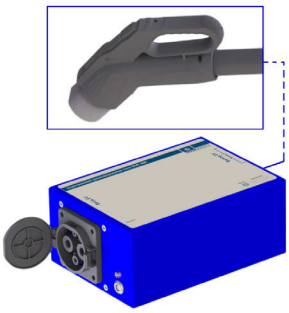
Energomonitor-3.1KM-A



EMT-200/500

Modification 1

Through type current transformer with GB/T connector



Modification 2

Busbar type current transformer

Devices under test

EV Charging Station

❶

❷

DC meter

200A/500A

Shunt 100A

Benefits of EMT-200/EMT-500

There are 2 design modifications:

1. Through-type transformer (Modification 1) provides connection to the charging station via CCS2 and GB/T standard connectors

2. Busbar-type transformer (Modification 2) as part of a test system (consisting of current and voltage sources) is used for testing (calibration) of a DC meter together with a current shunt.

Accuracy specifications of Energomonitor-3.1KM-A + EMT-200/500

#	Parameter	Range	Measurement error	Modification*
1	Voltage Rated voltages: 10, 30, 60, 120, 240, 480, 800 V	10 ... 1000 V	±0.02 % / ±0.05 %	
2	Current* Rated currents: 10, 20, 100, 200 (500) A	1 ... 250 A 1 A ... 500 A	±0.02 % / ±0.05 %	EMT-200 EMT-500
3	Power	0.01...250 kW 0.01...500 kW	±0.1 % / ±0.05 %	EMT-200 EMT-500

* Two modifications with respect to the current range are available

General specifications of EMT-200/500

Parameter	Value
Rated transformation ratio	1.33 to 133 A/V
Max output	1.875 V
Accuracy (error of transformation)	±0.05%/±0.02%
Power supply (via external adapter)	AC 230^{+23}_{-35} V 47...63 HZ
AC power consumption	100 VA, or less
Dimensions	161 × 85 × 144 mm / 305 × 200 × 120.5 mm, or less
Weight	3 kg / 5 kg, or less
Operating temperature range	–10 ... +50 °C

Scope of supply

1. Reference standard Energomonitor-3.1KM
2. Electronic Current Transformer EMT-200/500
3. Current Source 200 A / 500 A DC**
4. Voltage Source 1000 V DC**
5. Scanning head
6. External battery source
7. PC with software Energomonitor-CS installed
8. Set of cables
9. User manual
10. Package

** For testing DC meters

MARSENERGO
INSTRUMENTS FOR POWER INDUSTRY

MARS-ENERGO was established in 1991 to design, manufacture and provide technical support of high accuracy metrological equipment and test systems for power industry applications.

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MARS-ENERGO takes an active part in developing and maintaining the aggregate of measurement standards on national and CIS scale.

MARS-ENERGO manufactures reference devices and systems for accuracy testing and calibration of instruments measuring electrical quantities: power quality meters, energy metering systems, instrument transformers for conventional and smart (digital) substations, etc.

Quality management system complies with ISO 9001:2015

Information given in this catalogue is not a public offer and is provided for reference only

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